



By Alan Richter, Editor

THIS MONTH

Cutting Tool Engineering covers:

- A grinding machine that enables a PCD- or PCBN-tipped cutting tool to be processed in one setup; and
- A system that remotely diagnoses a malfunctioning machine.

EROSION EFFICIENCY

Eroding and polishing PCD- and PCBN-tipped cutting tools in one clamping helps ensure toolmakers accurately and efficiently produce those tools, and Vollmer of America Corp. has introduced a universal machine to do that. The QXD 200 is a 6-axis machine for manufacturing such cutters up to 250mm in diameter and 200mm in length.

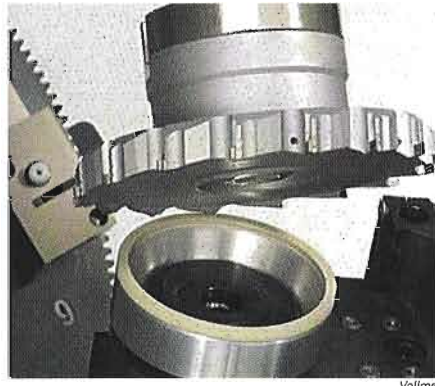
To boost productivity, the machine has a generator that reduces EDM erosion times by up to 30 percent compared to the company's previous generator, according to Scott Ries, product manager for the PCD group at Vollmer. The rotary, or disc, erosion process typically leaves 10µm to 20µm of superhard material for polishing with a grinding wheel, he noted.

Ries added that the erosion process is able to impart a cutting edge finish as fine as 0.18µm R_a , and a polished edge can be as fine as 0.05µm R_a .

The machine can also measure the grinding wheels, electrodes and workpiece location within the machining environment. "The machine understands where everything is located and what the dimensions are," Ries said, adding that the machine's automatic toolchanger holds a combination of up to six wheels and electrodes. "It provides the versatility to run different geometries without having an operator change electrodes, change wheels or remeasure where they're at because [the wheels and electrodes] were taken off and put back on."

Because of the novel arrangement of the axes, a tool is machined in a suspended position, the company reports.

Ries explained that Vollmer developed the vertical axis to improve tool runout because a tool can deflect due to its own weight when held with the conventional horizontal axis. That also helps keep the workpiece interface cleaner because debris is flushed down the tool. "It makes measurements more accurate as well," he said.



Through the integrated polishing capability, a toolmaker can produce a PCD- or PCBN-tipped tool in one clamping on the QXD 200 from Vollmer.

To eliminate the need to tweak a 3-D model of a tool prior to producing it, Vollmer developed ExLevel software to create "an exact replica of that 3-D model" in which the manufactured tool's tolerances don't vary from the model, Ries noted. The virtual simulation program also enables end users to verify that a tool design is correct and, if not, modify it before production begins by importing the tool's 3-D model into their modeling software, he explained.

The QXD 200 offers three options for delivering tools to the machine: a traditional magazine, a pallet system for 39 large-diameter workpieces and a pallet system for 64 small-diameter workpieces. The pallet systems are positioned on tracks outside the machine and enable integration of other parts of the manufacturing process, such as brazing and inspection, into the tool delivery system, Ries noted.

For more information about the QXD

200 and Vollmer of America Corp., Carnegie, Pa., call (412) 278-0655 or visit www.vollmer-us.com.

ASSISTANCE FROM A DISTANCE

On-site technicians rarely find the solution to a problem with an industrial machine in a manual, and experts frequently must travel to the manufacturer's site to get the equipment running again. Fraunhofer Institute for Communication, Information Processing and Ergonomics FKIE developed the augmented reality system to help experts remotely assist manufacturers.

The system allows technicians to record the malfunctioning machine with a camera attached to the back of a laptop monitor, according to the institute. An image processing program calculates the camera's position and direction of view and sends this data to the machine builder over standard telecommunications networks. The system is based on a chat protocol, which means everyone involved can communicate either through the chat function or by telephone.

The researchers minimized the quantity of data transmitted to allow the system to function over a cell phone network. "We only transmit location data, not pictures," said Dr. Thomas Alexander, head of the research team at the institute. "We do that by attaching 2-D bar codes to various parts of the machine. When the repair technician takes a picture of the malfunctioning machine, the software on the laptop reads those markings and links them to information in the database."

For more information about Fraunhofer FKIE, Wachtberg, Germany, call +49 228 9435-287 or visit www.fkie.fraunhofer.de.

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